

both from the press and the people. As soon as information can be gathered a full report on the flood will be made.—*I. M. Cline, Forecast Official.*

CHICAGO FORECAST DISTRICT.

Advisory messages were sent out as usual during the month to open ports on Lake Michigan in advance of approaching storms of considerable energy. The most severe storm of the month developed in the Southwest during the 21st, and moved slowly northeastward, reaching Lake Michigan on the 23d–24th. It was accompanied by snow and a westerly gale. Warnings were issued on the morning of the 23d, about twelve hours in advance of the storm; and, as no casualties of any kind were reported, it is probable that vessel masters profited by the advice given.

A cold wave developed in the British Northwest during the night of the 11–12th. Cold-wave warnings were ordered for North Dakota on the 11th, and for South Dakota, Nebraska, Minnesota, and northwestern Iowa on the 12th. The cold wave was practically confined to these limits, although a decided fall in temperature occurred over the greater portion of the district. Another cold wave appeared in the British Northwest on the morning of the 18th, and gradually overspread the entire district, reaching the eastern limits on the morning of the 21st. Ample warnings of its approach were issued; shippers, railroads, and other transportation companies being notified well in advance.—*H. J. Cox, Professor of Meteorology.*

DENVER FORECAST DISTRICT.

Severe weather prevailed in Wyoming and eastern Colorado from the 18th to the 23d, but with this exception the conditions, as regards temperature and precipitation, were such as are commonly noted during March.

The storm of the 18th, which was attended by snow and low temperatures in Wyoming and eastern Colorado, was forecast the preceding morning. This low area, which was persistent in the middle Plateau from the morning of the 12th until the night of the 17th, gave excessive cloudiness and an unusual amount of fog, but very little precipitation. Early in the morning of the 18th warnings of a cold wave, with high winds and snow, were sent to points in Wyoming and northeastern Colorado, and railroad interests were promptly advised. The snowfall was heavy, and being attended by a northerly gale, business and transportation were brought to a standstill, especially in north-central Colorado. The low temperatures that followed were rather severe to range stock interests.—*F. H. Brandenburg, Forecast Official.*

SAN FRANCISCO FORECAST DISTRICT.

The month opened with generally pleasant weather throughout California, quickly followed by a moderate storm over the northern portion of the State. Southwest storm warnings were displayed at Point Reyes at 8 p. m. on the 2d, but were not verified. Warnings of high southerly winds were sent to stations in Nevada and southern California; high winds prevailed on the 3d and the warnings must be considered as late. A moderate depression over the Sierra caused general rains in California and snow in Nevada; in the vicinity of Los Angeles unusually heavy rains fell. Heavy frost occurred on the morning of the 6th. Another disturbance prevailed on the coast on the 8th, and was also accompanied by generous rains throughout the entire State. Southeast storm warnings were displayed from Point Reyes to Eureka, and were verified, high southerly winds prevailing along the coast. On the 12th a rainfall of 2.32 inches was reported at Eureka. A marked disturbance prevailed over California and Nevada on the 13th; rain fell over the entire State and thunderstorms occurred in

the interior. The weather continued unsettled and showers fell on nearly every day in some portion of the State. A hail-storm occurred at San Francisco on the 16th. From the 17th to the 21st the weather was fair. Another disturbance appeared over Nevada on the 23d and, as in previous cases, was accompanied by general rain. At Los Angeles a rainfall of 3.32 inches was reported for the twenty-four hours ending 5 a. m., 25th. The weather continued unsettled during the rest of the month. Southeast storm warnings were displayed from Point Lobos on the 27th, and were verified. The month as a whole was an unusually stormy one; the rainfall much exceeds that of an average March. No serious frosts occurred and the damage to fruits was slight.—*A. G. McAdie, Professor.*

PORTLAND, OREG., FORECAST DISTRICT.

The storms of March passed inland farther south than usual and only one severe storm visited the North Pacific States during the month. It made its appearance over western British Columbia on the morning of the 9th, and storm warnings were immediately ordered at all stations in the district. The gale reached its height about twenty-four hours later, when maximum velocities of 90 miles at North Head and 68 miles at Tatoosh Island were recorded. Other storms occurred on the 6th, 26th, and 30th, for which warnings were displayed in time to be of benefit. Frosts were reported quite frequently during the last half of the month and were accurately forecast.—*E. A. Beals, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocity.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.....	27, a. m.*	51	114	4, a. m.	48	54	Miles. 4,200	Days. 5.0	Miles. 840	Miles. 35.0
II.....	2, p. m.	50	110	7, p. m.	46	60	2,650	5.0	530	22.1
III.....	6, p. m.	38	122	10, a. m.	46	60	3,400	3.5	971	40.4
IV.....	8, p. m.	41	124	12, p. m.	39	75	2,925	4.0	731	30.5
V.....	9, a. m.	51	114	16, a. m.	46	60	2,600	3.5	714	29.8
VI.....	11, p. m.	54	114	16, a. m.	46	60	2,800	4.5	622	25.9
VII.....	17, p. m.	54	114	23, p. m.	46	60	4,100	6.0	683	28.4
VIII.....	21, a. m.	51	120	26, p. m.	35	76	3,100	5.5	564	23.5
VIII.....	26, a. m.	53	108	30, a. m.	46	60	2,800	4.0	700	29.2
Sums.....							28,475	41.0	6,355	264.8
Mean of 9 paths.....							3,164		706	29.4
Mean of 41.0 days.....									694	28.9
Low areas.										
I.....	4, p. m.	39	120	8, a. m.	39	85	2,700	3.5	771	32.1
II.....	17, a. m.	38	114	20, p. m.	45	80	2,375	3.5	678	28.2
III.....	22, a. m.	29	95	23, a. m.	38	80	1,100	1.0	1,100	45.8
IV.....	23, p. m.	45	88	25, a. m.	48	68	975	1.5	650	27.1
V.....	28, a. m.	48	123	31, p. m.	46	60	3,000	3.5	857	35.7
VI.....	28, p. m.	25	82	31, p. m.	46	60	2,000	3.0	667	27.8
Sums.....							12,150	16.0	4,723	196.7
Mean of 6 paths.....							2,025		787	32.8
Mean of 16.0 days.....									759	31.6

* February.

For graphic presentation of the movements of these highs and lows see Charts I and II.—*Geo. E. Hunt, Chief Clerk, Forecast Division.*

RIVERS AND FLOODS.

The river conditions during March were exceptional and noteworthy, and the month will always be memorable for the general character and widespread extent of its floods. While the precipitation was not excessive, except in Louisiana and southeastern Texas, yet its periodic distribution was such that